

prominent superomarginals, all in a single linear series. Adambulacral armature as in *Solaster*. Papulæ numerous and prominent.

Type, *Crossaster alternatus*, Fisher, Proc. Washington Acad. Sciences, viii. 1906, p. 131. Santa Barbara Island, Cal., 414 fathoms.

XXV.—On a Collection of Mammals made by Mr. S. A. Neave, during his Expedition in Northern Rhodesia. By GUY DOLLMAN.

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THE area in which Mr. Neave collected is situated between Lake Bangweolo and Lake Mweru, bounded on the west by the Luapula River, and on the east by the Melinga Escarpment, extending as far north as the southern end of Lake Tanganyika and as far south as Mpika. No collection of mammals of any importance has ever been received from this district before, and therefore it is not surprising to find that some of the specimens represent new and hitherto undescribed forms. The mammalian fauna of this area would appear to be very similar to that of North Nyasaland, and though a few of the species show a distinct relationship with the West African fauna, the majority of forms are East African. The mammals of the Kalungwisi and Chambezi Rivers appear very much the same as those that occur on the Nyika Plateau, mixed with a sprinkling of South Nyasa forms, such as the small Zomba dormouse, *Graphiurus johnstoni*, Thos., a specimen of which Mr. Neave obtained from the Chambezi River District. Some of the species would appear to indicate a relationship with the Tanganyika and Uganda faunæ. Thus we find in the collection both the Marungu dormouse *Graphiurus microtis*, Noack, and the East African *Mus jacksoni*, de Wint.

Of the novelties, the Shrews are perhaps the most interesting. One of the forms, *Crociturus luna*, was obtained by Mr. Neave during his earlier expedition in Katanga. Since my paper on the Katanga mammals*, the series of Central and East African *Crociturus* in the British Museum collection has been considerably increased, and it is now evident that these Katanga specimens ought to be considered as

* Ann. & Mag. Nat. Hist. (8) iii. p. 350 (1909).

representing a distinct species. The series of *Lophuromys* from Mporokoso would appear to be new, being unlike any of the East or West African forms at present known. This species was also represented in the Katanga collection, and it is one of these Congo specimens that has been chosen as the type.

In addition to the descriptions of the new forms, a complete list of all the mammals obtained by Mr. Neave in Northern Rhodesia is here given, as so many of the species are of interest from a distributional point of view.

1. *Galago crassicaudatus*, E. Geoff.

♂. 172. Kalungwisi River.

2. *Galago nyosæ*, Elliot.

♂. 173. Kalungwisi Valley.

It is interesting to find this rare lemur occurring in Northern Rhodesia, the type, the only other specimen at present known, coming from Southern Nyasa.

3. *Scotophilus viridis damarensis*, Thos.

♂. 104. Lundazi River, Loangwa Valley.

4. *Scoteinus schlieffeni*, Peters.

♀. 147. Lofu River, south of Lake Tanganyika.

♂. 174. Kalungwisi Valley.

♀. 111. Upper Loangwa Valley.

5. *Pipistrellus nanus*, Peters.

♂. 144. Upper Kalungwisi River.

♀. 179. Edge of Chimpili Plateau.

♂. 143. Luwingu, Chimpili Plateau.

♀. 192. Loangwa River.

♂. 102. Loangwa Valley.

6. *Nasilio brachyurus*, B. du Bocage.

♂. 184. East of Lake Bangweolo.

♀. 164. Kalungwisi Valley.

These specimens would appear to belong to the West African species, *N. brachyurus*, and not to the South African form, *N. brachyrhynchus*, Smith. In Mr. Neave's last collection from Katanga the two species were both represented, apparently living side by side in the same locality.

7. *Crocidura neavei*, Wroughton.

♂. 166. Kalungwisi River.

C. neavei was founded by Wroughton on a single specimen contained in the 1905 Neave Collection from the Ndola District, the type locality being the Kafue River.

8. *Crocidura luna*, sp. n.

♂. 70; ♀. 71. Bunkeya River, Katanga, Congo.

♂. 94. Lufupa River, Katanga, Congo.

Similar in size to *Crocidura hindei*, Thos., but grey in colour instead of brownish red.

Tail rather long, otherwise proportions as in *C. hindei*. Fur of medium length, measuring about 6 mm. in length on back. General colour of upper surface smoke-grey (between slate-grey no. 1 and otter-brown no. 1, 'Repertoire de Couleurs'), rather browner on the back, paling to greyish brown on the sides. Individual hairs of back slaty grey at base, turning greyish white towards the apical portion, tips brown. Backs of hands and feet thinly covered with short greyish-white hairs. Under surface of body slaty grey, washed over with silvery white. Individual hairs of belly slate-grey with greyish-white tips. Tail thinly covered with short grey hairs; the longer hairs fairly numerous and evenly scattered throughout the basal half.

Skull with rather a broad cranial region.

Dimensions of the type (measured in the flesh) :—

Head and body 88 mm.; tail 60; hind foot 15; ear 12.

Skull: greatest length 24.5; basal length 21.3; greatest breadth across brain-case 10.5; greatest breadth across maxillary region 7.5; palatal length 10.5; length of upper tooth-row from front of first incisor to back of last molar 11.

Hab. Bunkeya River, Katanga, Congo, altitude 3400 feet.

Type. Adult male. B.M. no. 9. 1. 3. 3. Original number 70. Collected on August 31st, 1907.

This species is easily distinguished from its near allies by the cold grey colour of the fur, and the broad, rather flat skull.

9. *Crocidura electa*, sp. n.

♂. 150. Kamtoby, south of Lake Tanganyika.

♀. 152. Lofu Valley, Tanganyika Plateau.

Allied to the foregoing species, but rather smaller in size and with a shorter tail.

Tail rather short, nearly 10 mm. shorter than that of *C. luna*. General colour of upper surface very much as in *C. luna* (between slate-grey no. 1 and otter-brown no. 1, 'Repertoire de Couleurs'). Sides of head and flanks grey (slate-grey no. 1, 'Repertoire'). Individual hairs of back dark slaty grey at base, paling to greyish white terminally; tips brown. Lower surface of body silvery grey. Hairs of belly dark slate-coloured, with greyish-white tips. Tail very thinly clad with short grey hairs, a few longer hairs present on the basal half, as in *C. luna*.

Skull rather smaller than that of the foregoing species.

Dimensions of the type (measured in the flesh):—

Head and body 78 mm.; tail 47; hind foot 13·5; ear 10.

Skull: greatest length 23·3; basal length 20; greatest breadth across brain-case 10·3; greatest breadth across maxillary region 7·5; palatal length 10; length of upper tooth-row from front of first incisor to back of last molar 10·7.

Hab. Kamtoby, south of Lake Tanganyika. Altitude 4500 feet.

Type. Adult male. B.M. no. 9.12.4.15. Original number 150. Collected on August 21st, 1908.

This well-marked species is readily recognized by its small size, and although closely resembling *C. luna* in colour, it is distinguished at once by the smaller size of the body and proportionally shorter tail.

10. *Crocidura turba*, sp. n.

♂. 141; ♀. 140. Chilui Island, Lake Bangweolo.

♀. 181. Luwingu, between Lakes Bangweolo and Tanganyika.

♂. 178. Machinga Plateau, Kalungwisi District.

Size and general colour of upper surface very much as in *Crocidura fumosa*, Thos., but with a shorter tail, narrower skull, and pure grey-coloured belly.

Fur measuring about 5·5 mm. in length on back. General colour of upper surface dark brown (sepia no. 3, 'Repertoire de Couleurs'), slightly paler on flanks. Individual hairs of back grey with long brown tips. Backs of hands and feet thinly covered with short brownish hairs. Under surface of body silvery grey. Hairs of belly dark slate-coloured, tips greyish white. Tail covered with short dark hairs, intermingled with which are a number of longer hairs, irregularly scattered throughout the basal two-thirds of the tail.

Skull slender and long, rather narrow across maxillary and cranial regions.

Dimensions of the type (measured in the flesh):—

Head and body 96 mm.; tail 43·5; hind foot 15; ear 10·5.

Skull: greatest length 24; basal length 21; greatest breadth across brain-case 10; greatest breadth across maxillary region 7; palatal length 10; length of upper tooth-row from front of first incisor to back of last molar 10·7.

Hab. Chilui Island, Lake Bangweolo. Altitude 3900 feet.

Type. Adult male. B.M. no. 9. 12. 4. 17. Original number 141. Collected July 7th, 1908.

This shrew, though allied to *C. fumosa*, must be considered specifically distinct on account of its much narrower and longer skull and the pearl-grey coloured under parts.

11. *Crocidura* sp.

♂. 142. Chilui Island, Lake Bangweolo.

A large form apparently allied to the foregoing species. On account of its skull being very imperfect I am unable to definitely determine what species it is most nearly allied to, and until further specimens are available for examination it is impossible to settle the matter satisfactorily.

12. *Aonyx maculicollis*, Licht.

♂. 183. East of Lake Bangweolo.

Unlike the South African specimens, this otter has practically no white markings on the chest and throat. At present there is not material enough to hand to decide whether this character is of any specific value.

13. *Crossarchus fasciatus*, Desm.

♂. 175. Kalungwisi River.

14. *Helogale varia*, Thos.

♂. 176. Kalungwisi River.

15. *Canis lateralis*, Sclat.

♂. 128. Chambezi River.

16. *Paraxerus cepapi quotus*, Wrought.

♂. 101. Loangwa Valley.

17. *Heliosciurus rhodesiæ*, Wrought.

- ♂. 123, 124; ♀. 121. Chambezi River.
 ♂. 171. Kalungwisi River.
 ♂. 182. Luena River.

18. *Graphiurus microtis*, Noack.

- ♀. 157. Lofu Valley, Tanganyika Plateau.
 ♀. 177. Machinga Plateau, Kalungwisi District.
 ♀. 190. Mpika Plateau.

These specimens would appear to represent Noack's *G. microtis*, though they are all rather larger in size than the dimensions given in his description. As however the type locality of Noack's species was Marungu, there seems to be no reason why these Kalungwisi and Lofu specimens should be regarded as other than true *microtis*.

19. *Graphiurus johnstoni*, Thos.

- ♀. 127. Chambezi River.

20. *Tatera liodon*, Thos.

- ♀. 145. Lofu River, Tanganyika Plateau.
 ♀. 129. Chambezi River.
 ♂. 188; ♀. 186. East of Lake Bangweolo.

21. *Tatera nyasæ*, Wrought.

- ♀. 106, 107, 109. Upper Loangwa Valley.
 ♀. 112. Mirongo, Loangwa River.

22. *Otomys irroratus nyikæ*, Wrought.

- ♀. 139. Chirui Island, Lake Bangweolo.

23. *Dendromus whytei*, Wrought.

- ♀. 118. Chambezi Valley.

24. *Steatomys pratensis*, Peters.

- ♂. 185. East of Lake Bangweolo.
 ♀. 110. Upper Loangwa Valley.

25. *Mus rattus*, L.

- ♂. 131; ♀. 130. Luena, Bangweolo Basin.

26. *Mus chrysophilus*, de Wint.

- ♂. 146. Lofu River, Tanganyika Plateau.
 ♂. 113. Chinsali, Loangwa River.
 ♀. 103. Lundazi River, North Loangwa Valley.

27. *Mus walambæ*, Wrought.

- ♂. 120, 122, 125, 126. Chambezi River.
 ♂. 169. Kalungwisi River.
 ♀. 133. Edge of Chimpili Plateau.
 ♀. 132. Upper Luansenshi River.

28. *Mus coucha*, Smith.

- ♂. 138. Chishi Island, Lake Bangweolo.
 ♀. 189. Lower Chambezi River.

29. *Mus jacksoni*, de Wint.

- ♂. 163. Mporokoso, south of Lake Tanganyika.

30. *Thamnomys surdaster*, Thos. & Wrought.

- ♂. 153, 154, 156; ♀. 155. Lofu River, south end of Lake Tanganyika.

31. *Leggada triton murilla*, Thos.

- ♂. 165. Kalungwisi Valley.

32. *Leggada bella*, Thos.

- ♀. 137. Chishi Island, Lake Bangweolo.

33. *Lophuromys rita*, sp. n.

- ♂. 159, 160, 161; ♀. 162. Mporokoso, south of Lake Tanganyika.

♂. 86. Lufupa River, Katanga, Congo.

Allied to *L. zena*, Dollm., but redder in colour and rather more finely speckled.

Size and general proportions as in *L. zena*. Hair of the usual *Lophuromys* type, rather long on the back, measuring about 13 mm. in length. General colour of back reddish brown (between warm sepia no. 1 and burnt umber no. 2, 'Repertoire de Couleurs'), speckled all over with pinkish buff. Individual hairs of back reddish orange at base, gradually darkening towards apical portion to a brownish

red; subterminal rings orange, tips dark brown. Flanks rather paler than back. Backs of hands and feet brown, metatarsal region partially buffy. Under surface of body cinnamon-grey (snuff-brown no. 1, 'Repertoire'); individual hairs of belly buff-coloured at base, terminal halves grey, tips cinnamon. Chest brighter in colour (buff no. 1, 'Repertoire'), hairs without grey bases. Upper side of tail thinly covered with short dark brown hairs; lower surface very similar, hairs a little greyer.

Skull like that of *L. zena*; posterior nares rather broader.

Dimensions of the type (measured in the flesh):—

Head and body 107.5 mm.; tail 68; hind foot 21; ear 16.

Skull: condylo-basal length 29; basal length 26; condylo-basilar length 27; basilar length 24; zygomatic breadth 15; palatal length 14.6; palatilar length 13; greatest length of nasals 12; length of palatal foramina 6.3; length of upper tooth-row 5.

Hab. Lufupa River, Katanga, Congo. Altitude 4000 feet.

Type. Adult male. B.M. no. 9. 1. 3. 36. Original number 86. Collected on October 2nd, 1907.

In addition to the type Mr. Neave collected four specimens of *Lophuromys* at Mporokoso, south of Lake Tanganyika, all four being very similar in colour to the Katanga specimen.

This species would appear to be more nearly allied to the Aberdare form, *L. zena*, Dollm., than to *L. aquilus*, True, from which it is readily distinguished by the entire upper surface being finely speckled with pinkish buff. *L. zena* is rather more coarsely speckled, and the general colour of the upper and lower surfaces a good deal paler.

It is probable that when this genus is more fully known it may be thought necessary to reduce this form to subspecific rank. For the present, however, it is more convenient to regard it as a distinct species, since the relations of the other forms are not yet satisfactorily determined.

34. *Saccostomus campestris*, Peters.

♀. 187. East shore of Lake Bangweolo.

35. *Dasymys bentleyæ*, Thos.

♀. 180. Luwingu, north-east of Lake Bangweolo.

36. *Arvicanthis pulchellus*, Gray.

151. ♀. Lofu River, Tanganyika Plateau.

37. *Pelomys fallax*, Peters.

♀. 167, 168, 170. Kalungwisi River.

38. *Georychus mellandi*, Thos.

♂. 119. Chambezi Valley.

39. *Georychus amatus*, Wrought.

♂. 114, 116; ♀. 115, 117. Chambezi Valley.

♂. 134. Edge of Chimpili Plateau.

♂. 148, 149. Lofu River, south of Lake Tanganyika.

XXVI.—On Two new Species of Wood-boring Crustacea from Christmas Island. By W. T. CALMAN, D.Sc.

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[Plate V.]

AMONG the Crustacea collected by Dr. C. W. Andrews, F.R.S., on his visit to Christmas Island in 1908, and presented to the British Museum by Sir John Murray, K.C.B., F.R.S., are two species, an Amphipod and an Isopod, which were found boring into the piles of the pier at Flying-Fish Cove. It is worthy of note that, although both species are apparently undescribed, they belong to the same genera, *Chelura* and *Limnoria*, as the two species that are associated together in destroying submarine timber on our own coasts.

The aberrant Amphipod family Cheluridæ has hitherto comprised only a single species, the well-known *Chelura terebrans* of the North Atlantic and adjoining seas, and the discovery of a second species in the Indian Ocean is therefore of some interest.

Of the Isopod genus *Limnoria* five species have already been described. *L. pfefferi*, Stebbing, the only one known in tropical seas, comes from the island of Minikoi, but it appears to be very distinct from the species described below.

Order AMPHIPODA.

Suborder GAMMARIDEA.

Family Cheluridæ.

All necessary references to the literature of the family and of its type species will be found in Mr. Stebbing's invaluable *Ann. & Mag. N. Hist.* Ser. 8. Vol. v. 13